REMARKS

Claims 1-9 and 11-55 are pending with claims 1, 34, 35, 37, 46, and 51 being independent. Claims 1, 34, 46, and 51 have been amended to incorporate the features of claim 10 and claim 10 has been cancelled.

OBJECTION TO DRAWINGS

Applicant has amended the drawings to include the term "Prior Art." Accordingly, applicant requests withdrawal of this objection.

REJECTION OF CLAIMS 1, 2, 11-19, 30-33, 35, AND 46-55

Claims 1, 2, 11-19, 30-33, 35, and 46-55 are rejected as being obvious over U.S. Patent No. 6,212,498 (Sherwood) in view of U.S. Patent No. 5,765,132 (Roberts). Applicant requests withdrawal of this rejection for the following reasons.

Claims 1, 46, and 51

Independent claim 1 relates to a method of expanding an effective active vocabulary of a speech recognition system. Recognition candidates are received from a speech recognizer that performs speech recognition using a set of acoustic models representative of an active vocabulary of the system. The set of acoustic models includes models of words and models of word fragments.

When the received recognition candidate includes a word fragment, it is determined whether the word fragment may be combined with one or more adjacent word fragments or words to form a proposed word included in a backup dictionary of the speech recognition system using a spelling rule associated with the word fragment. As a result of using the associated spelling rule, a spelling of the proposed word differs from a spelling that would result from merely concatenating the particular word fragment with the one or more adjacent word fragments or words.

If the word fragment may be combined with one or more adjacent word fragments or words to form a proposed word included in a backup dictionary of the speech recognition system, the recognition candidate is modified to substitute the proposed word for the word fragment and the one or more adjacent word fragments or words used to form the proposed word. If the word fragment may not be combined with one or more adjacent word fragments or words to form a proposed word included in a backup dictionary of the speech recognition system, the recognition candidate is discarded.

Independent claim 46 relates to a computer-implemented speech recognition system that uses an expanded effective active vocabulary. The system includes a storage device configured to store an active vocabulary that includes multiple entries corresponding to words, commands, and word fragments. The system includes a processor configured to substantially perform the method of claim 1.

Independent claim 51 relates to computer software, residing on a computer readable medium, for a speech recognition system that uses an expanded effective active vocabulary to recognize words and commands. The computer software includes instructions for causing a computer to substantially perform the method of claim 1.

Applicant requests withdrawal of the rejection of claims 1, 46, and 51 because neither Sherwood nor Roberts describes or suggests combining a particular word fragment with one or more adjacent word fragments using an associated spelling rule in forming the proposed word and a spelling of a proposed word differing from a spelling that would result from merely concatenating the word fragment with the one or more adjacent word fragments or words.

Sherwood relates to an enrollment method for a speech recognition system. See Sherwood at abstract. Prior to enrollment, Sherwood details a speech recognition system that performs speech recognition on a user utterance to produce one or more recognition candidates. See Sherwood at Figs. 1-12. Sherwood's speech recognition system includes a complete dictation vocabulary that includes an active vocabulary 230 and a backup vocabulary 245. See Sherwood at Fig. 2 and col. 6, lines 1-5. Sherwood's speech recognition system also includes a

set of acoustic models 235 that represent phonemes. See Sherwood at Fig. 2 and col. 5, lines 24-53.

Roberts relates to a speech recognition system that adds a new word to a vocabulary of speech models. See Roberts at col. 1, lines 42-47; col. 4, lines 41-51; and Fig. 5. In Roberts, after the speech recognition system determines that a corrected word is not in the vocabulary, the speech recognition system isolates the speech frames for the new word to build a speech model for the new word. See Roberts at col. 5, line 22-53 and Figs. 6 and 7.

As the Examiner agrees, Sherwood and Roberts fail to describe or suggest use of spelling rules, as recited in claims 1, 46, and 51.

Accordingly, claims 1, 46, and 51 are allowable over Sherwood in view of Roberts.

Claims 2, 11-19, 30-33, 35, 47-50, and 52-55

Claims 2, 11-19, 30-33, 35, 47-50, and 52-55 depend from one of the independent claims discussed above and are allowable for at least the reasons that the independent claims are allowable.

Claim 35

Independent claim 35 relates to a method of generating an acoustic model of a word fragment. The method includes comparing a word of an active vocabulary to a similar word of a backup dictionary to identify a word fragment that may be used to convert the word of the active vocabulary to the word of the backup dictionary. The method also includes generating the acoustic model of the word fragment using a portion of an acoustic model of the word of the backup dictionary that is not included in an acoustic model of the word of the active vocabulary.

Applicant requests withdrawal of this rejection because any theoretical combination of Sherwood and Roberts would still fail to describe or suggest comparing a word of an active vocabulary to a similar word of a backup dictionary to identify a word fragment that may be used to convert the word of the active vocabulary to the word of the backup dictionary and generating the acoustic model of the word fragment using a portion of an acoustic model of the word of the

backup dictionary that is not included in an acoustic model of the word of the active vocabulary, as recited in claim 35.

As the Examiner correctly points out, Sherwood simply does not relate to word fragments. Accordingly, Sherwood cannot describe or suggest identifying a word fragment and generating an acoustic model of the word fragment.

Moreover, Roberts fails to cure the deficiencies of Sherwood. Roberts' speech recognition system does not identify a word fragment or generate an acoustic model of the word fragment. Rather, Roberts' speech recognition system merely determines that a corrected word is not in the vocabulary and then isolates the speech frames for the new word to build a speech model for the new word.

REJECTION OF CLAIMS 3 AND 34

Claims 3 and 34 are rejected as being obvious over Sherwood in view of Roberts and U.S. Patent No. 5,835,888 (Kanevsky). Applicant requests withdrawal of this rejection for the following reasons.

Claim 3

Claim 3 depends from claim 1, which was rejected as being obvious over Sherwood in view of Roberts. Kanevsky fails to cure the deficiencies of Sherwood to describe or suggest combining a particular word fragment with one or more adjacent word fragments using an associated spelling rule in forming the proposed word and a spelling of a proposed word differing from a spelling that would result from merely concatenating the word fragment with the one or more adjacent word fragments or words.

Kanevsky relates to a language model that is constructed by dividing words into word components. See Kanevsky at col. 2, lines 26-33. Kanevsky generates the language model by calculating the probability of a word as a "weighted sum of output probabilities of several" language models, which are built on word components and combinations of word components. See Kanevsky at col. 3, lines 6-17.

Though Kanevsky discusses word components, Kanevsky fails to show combining word components to form a proposed word using a spelling rule that produces a spelling of the proposed word that differs from a spelling that would result from merely concatenating the word component with other word components. Rather, as Kanevsky explains, the word components are merely concatenated: "stems are connected consequently ... and matched ... to see which concatenations of stems produce existing words in the vocabulary." See Kanevsky at col. 7, lines 16-21 and Fig. 7.

Accordingly, claim 1 is allowable over Sherwood in view of Roberts and Kanevsky. Claim 3 is allowable for at least the reasons that claim 1 is allowable.

Claim 34

Independent claim 34 relates to a method of recognizing speech. Recognition candidates are received from a speech recognizer that uses a set of acoustic models representative of an active vocabulary. The set of acoustic models includes models of words, models of roots that are not words, and models of affixes that are not words. The affixes include prefixes and suffixes.

When a received recognition candidate includes an affix, the method includes combining the affix with one or more adjacent words, roots, or other affixes to form a new word and modifying the recognition candidate to substitute the new word for the affix and the one or more adjacent words, roots, or other affixes used to form the new word.

Formation of the new word includes using a spelling rule associated with the affix that causes the spelling of the new word to differ from a spelling that would result from merely concatenating the affix with the one or more adjacent words, roots, or other affixes.

As discussed above with respect to claim 1, neither Sherwood, Roberts, nor Kanevsky describes or suggests combining a particular word fragment with one or more adjacent word fragments using an associated spelling rule in forming the proposed word and a spelling of a proposed word differing from a spelling that would result from merely concatenating the word fragment with the one or more adjacent word fragments or words. For this reason, the combination of Sherwood, Roberts, and Kanevsky also fails to describe or suggest formation of a

new word using a spelling rule associated with an affix that causes the spelling of the new word to differ from a spelling that would result from merely concatenating the affix with the one or more adjacent words, root, or other affixes that that form the new word. For this reason, claim 34 is allowable over Sherwood in view of Roberts and Kanevsky.

REJECTION OF CLAIMS 20, 21, 36, AND 37

Claims 20, 21, 36, and 37 are rejected as being obvious over Sherwood in view of U.S. Patent No. 6,092,044 (Baker). Applicant requests withdrawal of this rejection for the following reasons.

Claims 20 and 21

Claims 20 and 21 depend from claim 1, which was rejected as being obvious over Sherwood in view of Roberts and Kanevsky. Baker also fails to cure the deficiencies of Sherwood to describe or suggest combining a particular word fragment with one or more adjacent word fragments using an associated spelling rule in forming the proposed word and a spelling of a proposed word differing from a spelling that would result from merely concatenating the word fragment with the one or more adjacent word fragments or words.

Baker relates to generating pronunciations for words added to a dictation vocabulary used in a speech recognition system. See Baker at col. 1, lines 5-8. To add a new word, the user types and utters the word and the speech recognition system creates a constraint grammar containing a word list of possible phonetic spellings using the spelled word and a rules list. See Baker at col. 15, lines 56-64. The rules list associates phonemes with letters and strings of letters and their frequency of occurrence in the vocabulary. See Baker at col. 15, lines 60-63. The rules list may alternatively be used to create a net of all possible phonetic spellings of the spelled word. See col. 17, lines 32-42.

In both cases, Baker's speech recognition system fails to describe or suggest using a spelling rule associated with the letters. Rather, as discussed above, Baker's system associates phonemes with the letters. Moreover, Baker's speech recognition system also fails to describe or

suggest that the spelling of the spelled word somehow differs from a spelling that would result from merely concatenating the letters. Rather, the spelling of the word is exactly the spelling that the user types.

Accordingly, claims 1 is allowable over Sherwood in view of Baker. Claims 20 and 21 are allowable for at least the reasons that claim 1 is allowable.

Claim 36

Claim 36 depends from claim 35, which was rejected as being obvious over Sherwood in view of Roberts. Baker fails to cure the deficiencies of Sherwood to describe or suggest comparing a word of an active vocabulary to a similar word of a backup dictionary to identify a word fragment that may be used to convert the word of the active vocabulary to the word of the backup dictionary and generating the acoustic model of the word fragment using a portion of an acoustic model of the word of the backup dictionary that is not included in an acoustic model of the word of the active vocabulary, as recited in claim 35.

Baker's speech recognition system chooses the best phonetic spelling from the constraint grammar by recognizing the spoken word against the constraint grammar. See Baker at col. 16, lines 1-4. Though the spelled word and the phonetic spelling of the best result are added to the dictionary, Baker does not compare a word of an active vocabulary to a similar word in a backup dictionary or identify a word fragment that may be used to convert a word in an active vocabulary to a word in a backup dictionary. Rather, the spoken word is recognized against the constraint grammar.

For these reasons, claim 35 is allowable over Sherwood in view of Roberts and Baker. Claim 36 is allowable for at least the reasons that claim 35 is allowable.

Claim 37

Independent claim 37 relates to a method of generating acoustic models of word fragments. The method includes comparing words of an active vocabulary to similar words of a backup dictionary to identify spelling rules that may be used to convert the words of the active

vocabulary to words of the backup dictionary, and employing the spelling rules in identifying word fragments.

Applicant requests withdrawal of the rejection of claim 37 because any possible combination of Sherwood and Baker would still fail to describe or suggest comparing words of an active vocabulary with similar words of a backup dictionary to identify spelling rules that may be used to convert the words of the active vocabulary to words of the backup dictionary and employing the spelling rules in identifying word fragments.

As discussed above and as the Examiner agrees, Sherwood fails to describe or suggest identifying spelling rules and using spelling rules to identify word fragments. Furthermore, Baker also fails to describe or suggest identifying spelling rules that may be used to convert words of an active vocabulary to words of a backup dictionary and employing the spelling rules to identify word fragments. As discussed above, in Baker's system, a user spells and speaks a word to be added to a vocabulary and the spoken word is recognized against the constraint grammar. Baker's speech recognition system does not identify spelling rules to convert words or identify fragments of words.

Accordingly, claim 37 is allowable over Sherwood in view of Baker.

REJECTION OF CLAIMS 4-9[1], 22-29, AND 38-45

Claims 4-9, 22-29, and 38-45 are rejected as being obvious over Sherwood in view of Roberts, Kanevsky, and Baker. Applicant requests withdrawal of this rejection for the following reasons.

Claims 4-9 and 22-29

Claims 4-9 and 22-29 depend from claim 1, which was rejected as being obvious over Sherwood in view of Roberts and Kanevsky. As discussed above, Baker fails to cure the deficiencies of Sherwood to describe or suggest combining a particular word fragment with one or more adjacent word fragments using an associated spelling rule in forming the proposed word

[1] Applicant does not include claim 10 in the recitation of the rejected claims as claim 10 has been cancelled.

and a spelling of a proposed word differing from a spelling that would result from merely concatenating the word fragment with the one or more adjacent word fragments or words.

For these reasons, claim 1 is allowable over Sherwood in view of Roberts, Kanevsky, and Baker.

Claims 4-9 and 22-29 are allowable for at least the reasons that claim 1 is allowable.

Claims 38-45

Claims 38-45 depend from claim 37, which was rejected as being obvious over Sherwood in view of Baker. As the Examiner agrees, Roberts fails to describe or suggest use of spelling rules. Rather, in Roberts, speech models are built using extracted speech frames. See Roberts at abstract.

Furthermore, Kanevsky also fails to describe or suggest use of spelling rules. In Kanevsky, though concatenations of stems are matched with the vocabulary 72 to see which concatenations produce words, the concatenations are not words of an active vocabulary and the matching does not identify spelling rules that may be used to convert words of an active vocabulary to words of the vocabulary 72. See Kanevsky at col. 7, lines 16-22.

For these reasons, claim 37 is allowable over Sherwood in view of Baker, Roberts, and Kanevsky. Claims 38-45 are allowable for at least the reasons that claim 37 is allowable.

Enclosed is a petition for a three-month extension of time. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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